

SULIT



**BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENDIDIKAN MALAYSIA**

JABATAN KEJURUTERAAN ELEKTRIK

PEPERIKSAAN AKHIR

SESI DISEMBER 2018

DET1013: ELECTRICAL TECHNOLOGY

TARIKH : 23 APRIL 2019

MASA : 8.30 PAGI - 10.30 PAGI (2 JAM)

Kertas ini mengandungi **SEBELAS (11)** halaman bercetak.

Bahagian A: Objektif (10 soalan)

Bahagian B: Struktur (4 soalan)

Bahagian C: Esei (2 soalan)

Dokumen sokongan yang disertakan : Tiada

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

SECTION B: 60 MARKS
BAHAGIAN B: 60 MARKAH

INSTRUCTION:

This section consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN:

*Bahagian ini mengandungi **EMPAT (4)** soalan berstruktur. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO1
C1

- (a) State **THREE (3)** main effects of electric current.

*Nyatakan **TIGA (3)** kesan utama arus elektrik.*

[3 marks]

[3 markah]

CLO1
C2

- (b) By referring to Figure B1 (b), calculate the voltage drop through each resistor using Voltage Divider Rule.

Dengan berpandukan Rajah B1(b), kirakan susut voltan pada setiap perintang menggunakan Hukum Pembahagi Voltan.

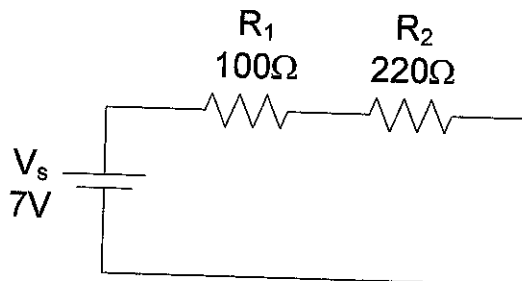


Figure B1(b) / Rajah B1(b)

[5 marks]

[5 markah]

CLO2
C3

- (c) Calculate the total resistance and current through each resistor by referring to Figure B1(c).

Kirakan jumlah rintangan dan arus yang melalui setiap perintang merujuk pada Rajah B1(c).

[7 marks]
[7 markah]

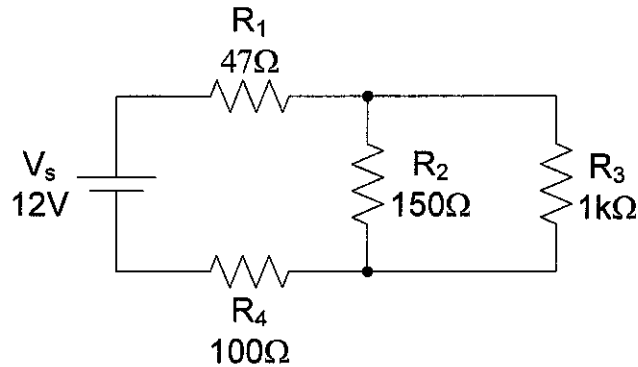


Figure B1(c) / Rajah B1(c)

QUESTION 2 SOALAN 2

CLO1
C1

- (a) Define Norton Theorem.

Takrifkan Teorem Norton.

[3 marks]
[3 markah]

CLO1
C2

- (b) Referring to Figure B2 (b), convert Thevenin equivalent circuit to Norton equivalent circuit. Determine the Norton Current, I_N and Norton Resistance, R_N .

Merujuk kepada Rajah B2 (b), tukarkan litar setara Thevenin kepada litar setara Norton. Tentukan Arus Norton, I_N dan Rintangan Norton, R_N .

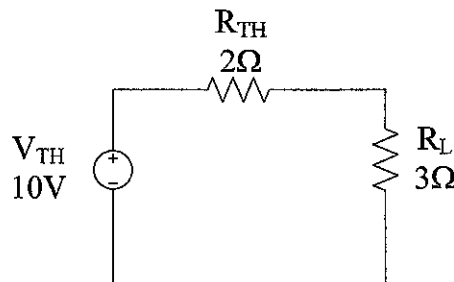


Figure B2 (b) / Rajah B2 (b)

[5 marks]
[5 markah]

CLO2
C3

- (c) Based on Figure B2(c), calculate Thevenin Resistance, R_{TH} and Thevenin Voltage, V_{TH} through Load Resistance, R_L using Thevenin Theorem.

Berdasarkan Rajah B2(c), kirakan Rintangan Thevenin, R_{TH} dan Voltan Thevenin, V_{TH} yang melalui rintangan beban, R_L menggunakan Teorem Thevenin.

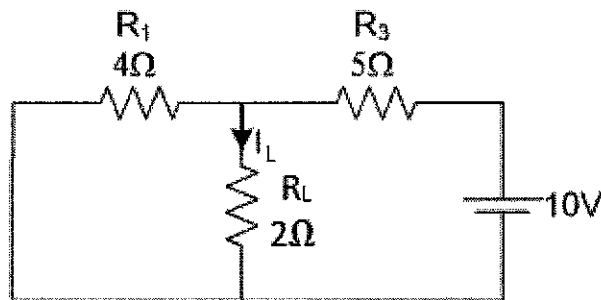


Figure B2(c) / Rajah B2(c)

[7 marks]

[7 markah]

QUESTION 3

SOALAN 3

CLO1
C2

- (a) Explain and draw a suitable diagram for the first Faraday's Law.

Terangkan dan lukis menggunakan gambarajah yang sesuai mengenai Hukum Faraday yang pertama.

[3 marks]

[3 markah]

CLO1
C3

- (b) Calculate the equivalent inductance, L_T between terminal **a** and **b** as shown in Figure B3 (b).

*Kirakan aruhan setara, L_T antara terminal **a** dan **b** seperti yang ditunjukkan dalam Rajah B3 (b).*

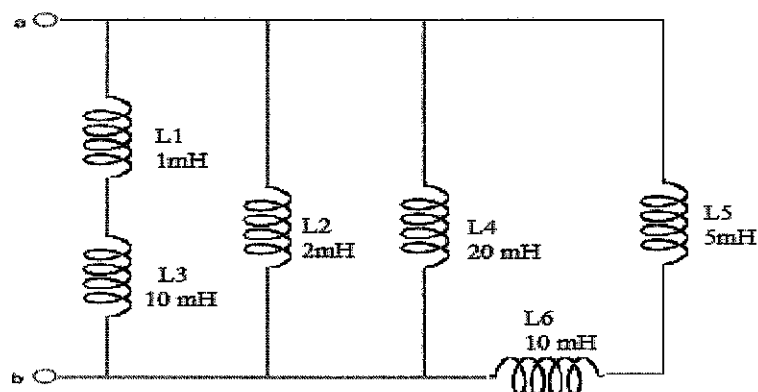


Figure B3(b) / Rajah B3(b)

[6 marks]

[6 markah]

CLO2
C3

- (c) By referring to Figure B3(c), calculate the inductor current after the switch is closed for $30\mu\text{s}$.

Dengan merujuk kepada Rajah B3(c), kirakan arus yang melalui pearuh selepas $30\mu\text{s}$ suis ditutup.

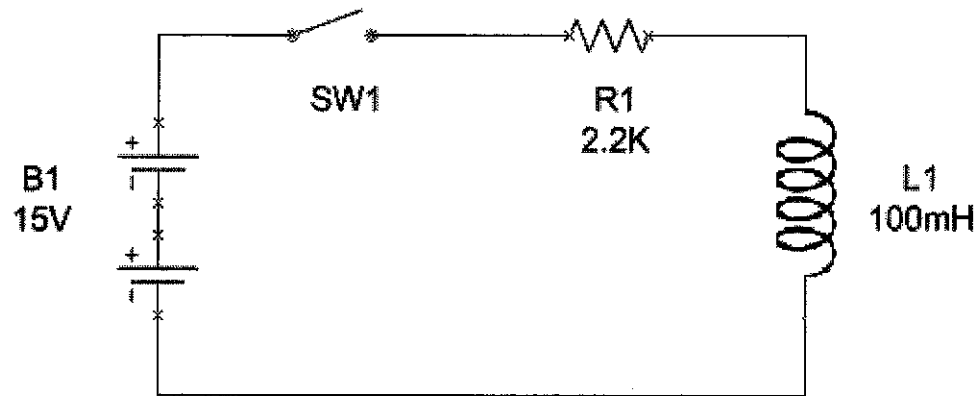


Figure B3(c) / Rajah B3(c)

[6 marks]
[6 markah]

QUESTION 4 SOALAN 4

CLO1
C1

- (a) By referring to Figure B4(a), state the finger representation of Fleming's Right Hand Rule.

Dengan merujuk kepada Rajah B4(a), nyatakan perwakilan jari bagi Hukum Tangan Kanan Fleming.

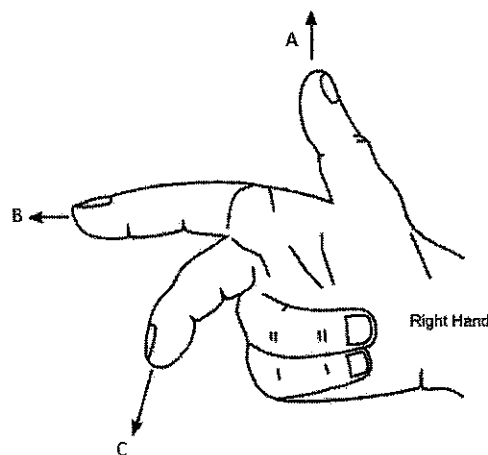


Figure B4(a)/ Rajah B4(a)

[3 marks]
[3 markah]

CLO1
C2

- (b) By using a suitable diagram, explain **ONE (1)** method to determine magnetic field direction.

*Dengan menggunakan gambarajah yang sesuai, terangkan **SATU (1)** kaedah untuk menentukan arah medan magnet.*

[5 marks]
[5 markah]

CLO2
C3

- (c) A coil having 200 turns and carry 0.5A current. If the length of magnetic circuit is 20cm, calculate the magnetomotive force and magnetic field strength.

Satu gegelung mempunyai 200 lilitan dan membawa arus 0.5A. Jika panjang litar magnetik ialah 20cm, kirakan daya gerak magnet dan kekuatan medan magnet.

[7 marks]
[7 markah]

SECTION C: 30 MARKS

BAHAGIAN C: 30 MARKAH

INSTRUCTION:

This section consists of **TWO (2)** essay questions. Answer **ALL** questions.

ARAHAN:

*Bahagian ini mengandungi **DUA (2)** soalan esei. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO2
C3

Calculate the current I_1 , I_2 and I_3 in Figure C1 by using Kirchoff Law.

Kirakan arus I_1 , I_2 dan I_3 dalam Rajah C1 dengan menggunakan Hukum Khirchoff.

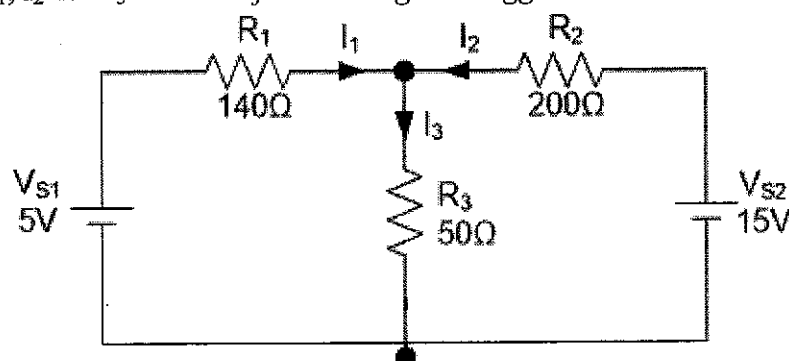


Figure C1 / Rajah C1

[15 marks]
[15 markah]

QUESTION 2**SOALAN 2**CLO2
C3

A $220\mu\text{F}$ capacitor is connected in series with a $1.3\text{k}\Omega$ resistor and a 120VDC voltage supply. Calculate the initial current, the time constant during charging, the time taken to be fully charge, potential different across capacitor at $t = 2\text{ms}$ and the energy stored in the capacitor.

Pemuat $220\mu\text{F}$ disambungkan secara sesiri dengan perintang $1.3\text{k}\Omega$ dan bekalan voltan 120VDC . Kirakan arus permulaan, pemalar masa semasa mengecas, masa yang diambil untuk mengecas sepenuhnya, beza keupayaan merentasi pemuat pada masa $t = 2\text{ms}$ dan tenaga yang disimpan dalam pemuat.

[15 marks]

[15 markah]

SOALAN TAMAT

